

ABSTRACT OF THE DISCLOSURE

A CVD process for producing low-dielectric constant, SiOC thin films using organosilicon precursor compositions having at least one alkyl group and at least one cleavable organic functional group that when activated rearranges and cleaves as a highly volatile liquid or gaseous by-product. In a first step, a dense SiOC thin film is CVD deposited from the organosilicon precursor having at least one alkyl group and at least one cleavable organic functional group, having retained therein at least a portion of the alkyl and cleavable organic functional groups. In a second step, the dense SiOC thin film is post annealed to effectively remove the volatile liquid or gaseous by-products, resulting in a porous low-dielectric constant SiOC thin film. The porous, low dielectric constant, SiOC thin films are useful as insulating layers in microelectronic device structures. Preferred porous, low-dielectric SiOC thin films are produced using di(formato)dimethylsilane as the organosilicon precursor.